August 14, 2008

Mr. Bill Rogers
Department of Environmental Quality
Air Quality Division
Stationary Source Program
1410 North Hilton
Boise, Idaho 83706-1255

RE: Permit to Construct Application
Eagle Silicon – Caldwell Facility

Dear Mr. Rogers:

Eagle Silicon owns and operates a silicon recycling facility in Caldwell, Idaho. Eagle Silicon is submitting a permit to construct (PTC) application to Idaho Department of Environmental Quality (IDEQ) to install two baghouses and additional hydrofluoric acid (HF) systems. The enclosed application contains all of the information required by IDAPA 58.01.01.200, including IDEQ's standard forms, emission calculations, and a detailed process description. Eagle Silicon is including the requisite $1,000 PTC application filing fee with this application.

This PTC application also includes the exemption determination information (emission calculations and source test data) for the June 2008 HF system installation project, which qualified for a Level 1 exemption (IDAPA 58.01.01.232.02.a). Eagle Silicon requests the HF system exemption determination included with this PTC application satisfy the annual reporting requirement for toxic air pollutant exemptions (IDAPA 58.01.01.232.05).

Additionally, with this submittal, Eagle Silicon requests the opportunity to review a copy of the draft PTC. Once the draft PTC is complete, please provide a copy to cory@eaglesilicon.com and ehansen@environcorp.com .

Please feel free to call me at 208-890-1021 or Eric Hansen of ENVIRON International Corporation at 425-672-1440 if you have any questions or need additional information.

Pursuant to IDAPA 58.01.01.123, I hereby certify that, based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate, and complete.

Sincerely,

Cory Russell
Vice President
Eagle Silicon

cc: Eric Hansen, ENVIRON International Corporation

Eagle Silicon
Permit to Construction Application

Prepared for:
Eagle Silicon
Caldwell, Idaho

Prepared by:
ENVIRON International Corporation
Lynnwood, Washington

Date:
August 2008

Project Number:
03-21308A

ENVIRON

Contents

1 Introduction

Eagle Silicon owns and operates a silicon recycling facility in the Caldwell area of Canyon County, Idaho. The Eagle Silicon Caldwell facility consists of a single recycling building located at 3605 Arthur Street in Caldwell, Idaho. Eagle Silicon is proposing to install two 5,000 cubic feet per minute (cfm) baghouses for interior ventilation of the recycling building and additional hydrofluoric acid (HF) systems at their Caldwell facility. A detailed process description is included in Section 2 of this permit to construct (PTC) application.

Until recently, the semi-conductor industry discarded silicon wafers that did not meet specifications. Eagle Silicon now purchases the discarded wafers from semi-conductor manufacturers to recycle the silicon. The recycled silicon wafers are then sold to customers who reformulate the silicon into a form that can be used for new products. At present, the largest consumer of recycled silicon is the solar panel industry.

Eagle Silicon is submitting this PTC application to satisfy the requirements of IDAPA 58.01.01.200 (Procedures and Requirements for Permits to Construct). Appendix A contains Idaho Department of Environmental Quality's (IDEQ's) standard PTC forms. Figure 1-1 displays the facility location while Figure 1-2 provides a scaled site layout of the Eagle Silicon Caldwell facility.

2 Project Description

Eagle Silicon proposes to install two 5,000 cfm baghouses and additional HF systems at their silicon recycling facility located in Caldwell, Idaho. The proposed baghouses will provide interior ventilation for the Caldwell facility and the additional HF systems will allow flexibility to recycle additional silicon wafers. Descriptions of the silicon recycling processes are provided below, and a process flow diagram is displayed in Figure 2-1.

Eagle Silicon has recently begun purchasing broken wafers and wafers that have already been imprinted with dies (small blocks of semi-conducting material fabricated into a circuit). Before the silicon can be sold for other manufacturing uses, the die must be removed from the wafer. Eagle Silicon is currently experimenting with various means of mechanically removing the metals and other materials from the wafers so that only very pure silicon remains. This research and development work is currently being conducted in an enclosed building with no exhausts to atmosphere. However, Eagle Silicon anticipates that increases in production of recycled silicon will require dust collection and venting to atmosphere. The following two subsections describe the two methods Eagle Silicon uses to remove die from wafers

2.1 Mechanical Die Removal

At present, Eagle Silicon is experimenting with a number of machines that can be used to remove dies from wafers. The machines rely on gentle abrasion using silicon carbide in rotating containers. Some of the containers are open-topped bowls that rotate on a vertical axis, and the other containers are fully-enclosed drums that rotate on a horizontal axis. Presently, Eagle Silicon operates all of the containers in a batch mode with processing times ranging from one to two days. After visual inspection confirms that satisfactory silicon cleaning has been accomplished, the container contents are manually dumped into a transfer container. The mixture of silicon and waste is then manually screened, with silicon wafers remaining above the screen, and silicon carbide and circuitry passing through the screen into a waste container. The clean silicon wafers are then stored for sale, and the screened silicon carbide can be reused for cleaning a new batch of discarded silicon wafers. Eagle Silicon currently uses mobile mini-baghouses (that vent inside the building) to collect dust from the open-topped bowls and product transfer points.

2.2 Chemical Die Removal

Instead of mechanically removing die from silicon wafers, Eagle Silicon can also use a series of three baths containing a HF solution (approximately 25 percent HF and 75 percent water, by weight) to remove the dies from discarded silicon wafers. Hydrofluoric acid readily dissolves metal oxides, including the die on a discarded silicon wafer. The HF system is comprised of three baths, each approximately 12 inches wide by 17 inches long, located

under a hooded chamber. Exhaust air from the chamber pulls HF fumes from the three baths into a solid lime dry scrubber before venting to atmosphere. Eagle Silicon is proposing to install additional HF systems, with designs similar to the existing system, within the next year. In order to maintain flexibility of installing these new HF systems, Eagle Silicon is proposing a facility-wide HF emission limit. The proposed HF emission limit and recordkeeping requirements are presented in Section 3.2.

3 Emission Sources and Calculations

The Eagle Silicon Caldwell facility will emit air pollutants from multiple point sources: the two proposed baghouses and two or more HF scrubber stacks.

Table 3-1 provides a summary of facility-wide criteria pollutant potential to emit. Annual emission rates for the emission sources are conservatively based on continuous operation (24-hours per day, 365 days per year). Appendix B presents detailed emission calculations for the Eagle Silicon Caldwell facility. The remainder of this section discusses each emission calculation in more detail.

3.1 Criteria Pollutant Emission Rates

Each of the two proposed 5,000 cfm baghouses will be designed to emit no more than 0.01 grains per dry standard cubic foot (gr/dscf) exhaust. ENVIRON used the baghouse design grain loading and air flowrate to calculate particulate matter (PM) and particulate matter with a diameter less than 10 microns (PM_{10}) emissions from the two proposed baghouses. For a grain loading of 0.01 gr/dscf, each baghouse is expected to emit 0.4 pounds per hour (lb/hr) and 1.9 tons per year (tpy), at the design air flowrate. All PM was assumed to be PM_{10} or smaller. A baghouse vendor has not yet been selected.

The two proposed baghouses will be the only sources of PM and PM_{10} at the facility. Eagle Silicon has no other sources of criteria pollutant emissions.

3.2 Toxic Air Pollutant Emissions

The Eagle Silicon Caldwell facility emits only one TAP, HF, which is also listed as a federal hazardous air pollutant (HAP). Eagle Silicon installed a HF system (HF baths, hood, and scrubber) in June 2008. The HF system installation project qualified for a Level I exemption as defined in IDAPA 58.01.01.223.02.a, and described below.

Eagle Silicon provided ENVIRON with information regarding their HF system, including the HF bath surface area, temperature, and HF concentration. ENVIRON was then able to calculate the uncontrolled HF emission rate based on HF volatilization from the three baths. ENVIRON calculated the uncontrolled HF emission to be 0.065 lb/hr and 0.28 tpy. Accordingly, the

uncontrolled HF emissions for the past HF system installation project are below the fluorides screening emission level (0.167 lb/hr) in IDAPA 58.01.01.585. Detailed calculations of the uncontrolled HF emission rates are provided in Appendix B.

Eagle Silicon retained the Avogadro Group to measure controlled HF emissions from the dry scrubber stack. The Avogadro Group conducted three tests using EPA Method 26 and determined an average HF exhaust concentration of 46 parts per million by dry volume (ppmdv), which is equivalent to an HF emission rate of 0.0076 lb/hr. This emission rates is also less than the fluorides screening emission level identified in IDAPA 58.01.01.585.

Eagle Silicon proposes to install additional HF systems, with designs similar to the HF system source tested, at the Caldwell facility and accept a facility-wide limit of 0.166 lb HF/hr. Eagle Silicon proposes to keep records of potential hourly HF emissions at the Caldwell facility by multiplying the HF system source test results (46 ppmdv HF) with the maximum air flowrate (dry standard cubic feet per hour [dscfh]) for all HF systems at the Caldwell facility. Based on the proposed hourly HF emission limit, ENVIRON calculated HF emissions from the Eagle Silicon Caldwell facility to be 0.73 tpy.

4 Regulatory Setting

The proposed baghouse installation project is potentially subject to both Federal and State regulations. The following section discusses the applicable regulations and why certain Federal and State regulatory programs are not applicable.

4.1 Federal Regulations

4.1.1 Prevention of Significant Deterioration

Silicon recycling facilities are not a designated facility under 40 CFR52.21(b); as such, the Eagle Silicon facility is deemed a minor source for purposes of the Prevention of Significant Deterioration (PSD) program unless emissions of a regulated pollutant exceed 250 tpy. Facility-wide criteria pollutant potential to emit (PTE) rates are summarized in Table 3-1. The Eagle Silicon Caldwell facility will be a minor source with respect to PSD because the highest annual criteria pollutant PTE is less than the 250 tpy threshold. Accordingly, the Eagle Silicon Caldwell facility will not be a major source and will not be subject to PSD permitting requirements.

4.1.2 Air Operating Permit Program

Air operating permits are required for facilities with regulated pollutant emissions exceeding 100 tpy, collective HAP emissions exceeding 25 tpy, or emissions of any single HAP exceeding 10 tpy. As presented in Table 3-1 and Section 3.2, the Eagle Silicon Caldwell facility's criteria pollutant and HAP emissions are less than the air operating permit major source thresholds.

4.1.3 New Source Performance Standards

EPA has established performance standards for a number of air pollution sources in 40 CFR Part 60. These New Source Performance Standards (NSPS) usually represent a minimum level of control that is required of a new source. There are no NSPS sections that apply to the silicon recycling equipment.

4.1.4 National Emission Standards for Hazardous Air Pollutant

EPA has established National Emission Standards for Hazardous Air Pollutants (NESHAP) under 40 CFR 63 to regulate HAP emissions from various industrial sources and activities. However, none of these standards apply to the Eagle Silicon Caldwell facility's sources because, as described in Section 3.2 of this application, the facility is not a major source of HAPs.

4.2 State and Local Emission Regulations

4.2.1 Permit to Construct Program

IDEQ's PTC regulations require all facilities to obtain a PTC before beginning construction of a new source of air pollution or modifying an existing source in a manner that would cause its emissions to increase, unless the source is considered exempt. This application complies with the PTC program requirements for the proposed project to install two baghouses and multiple HF scrubbers.

4.2.2 Tier I Operating Permit

EPA has delegated the authority to issue Title V Air Operating Permits to IDEQ. The Caldwell facility's annual potential criteria pollutant and HAP emission rates are below the air operating permit major source thresholds outlined in Section 4.1.2.

4.2.3 General Requirements

The only state requirements directly applicable to the project are rules that address general air quality issues, including:

- Opacity [IDAPA 58.01.01.625], and
- Particulate Matter – Process Weight Limitations [IDAPA 58.01.01.700]. However, the maximum potential PM and PM_{10} emission rate from each baghouse will be approximately 0.4 lb/hr, which is less than minimum allowable emission limit (1 lb/hr), identified in 58.01.01.700.02.

5 Dispersion Modeling Analysis

The proposed baghouse installation project and proposed HF system installations will cause an increase in potential emissions at the Caldwell facility. Eagle Silicon's proposed facility-wide HF emission limit (0.166 lb/hr) is below the IDEQ modeling threshold for fluoride emissions. The increase in PM_{10} emissions is greater than the published modeling threshold in the State of Idaho Air Quality Modeling Guideline. However, the two proposed baghouses will be the only sources of PM and PM_{10} emissions at the Caldwell facility. IDEQ has developed a secondary discretionary modeling threshold that can be applied on a case-by-case basis. ENVIRON provided IDEQ with the proposed baghouse stack locations, stack parameters, and potential emission rates; and, according to IDEQ, a modeling analysis to determine compliance with the NAAQS is not required for this PTC application. ENVIRON's correspondence with IDEQ is provided in Appendix C.

Table 3-1: Proposed Baghouses Potential to Emit					
	Proposed Baghouse 1 Potential to Emit		Proposed Baghouse 2 Potential to Emit		Facility-Wide Potential to Emit
Pollutant	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(tpy)
NOx	--	--	--	--	--
CO	--	--	--	--	--
SO2	--	--	--	--	--
PM_{10}	0.4	1.9	0.4	1.9	3.8
VOC	--	--	--	--	--

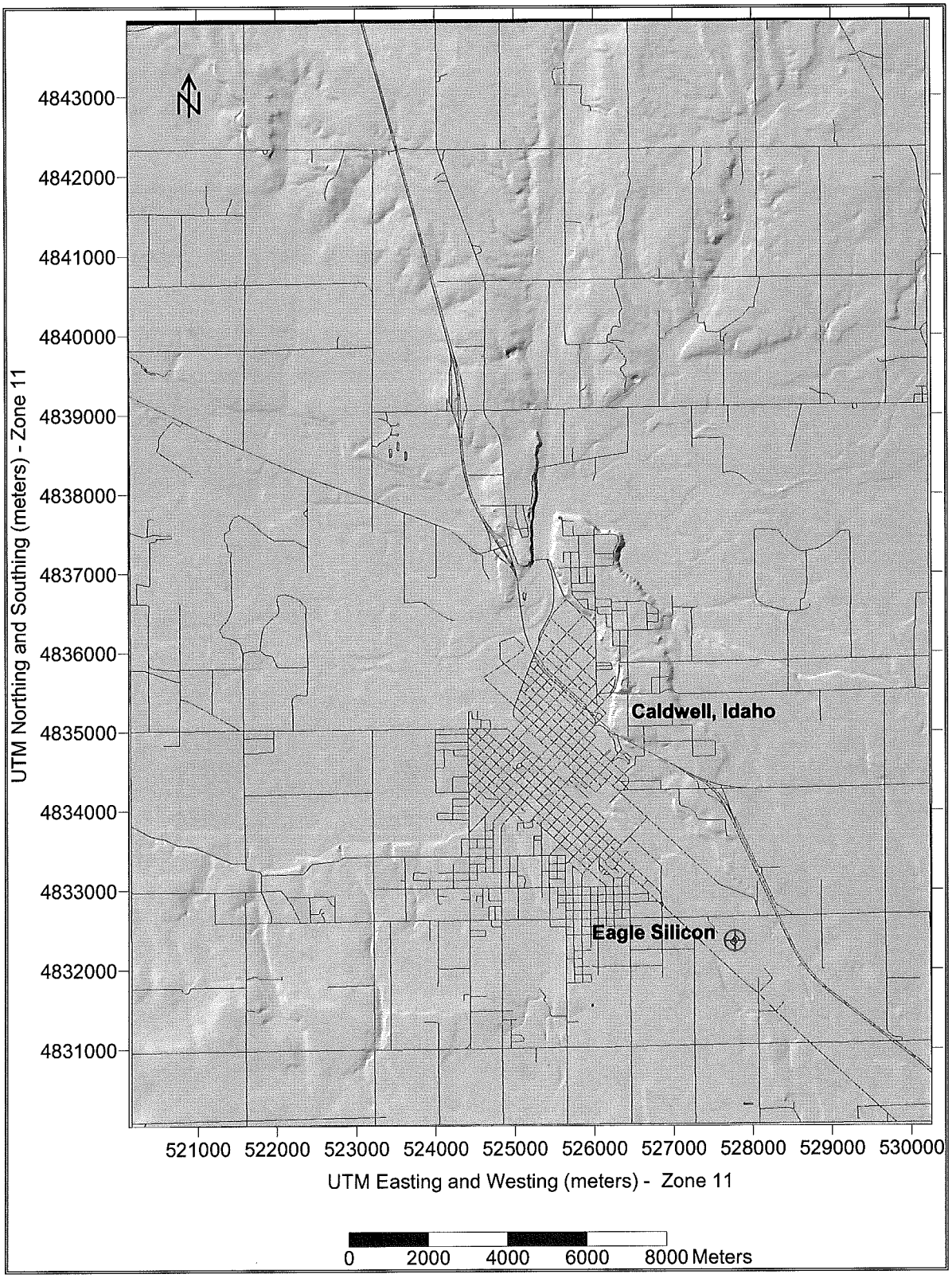


Figure 1-1: Location of the Eagle Silicon Caldwell Facility

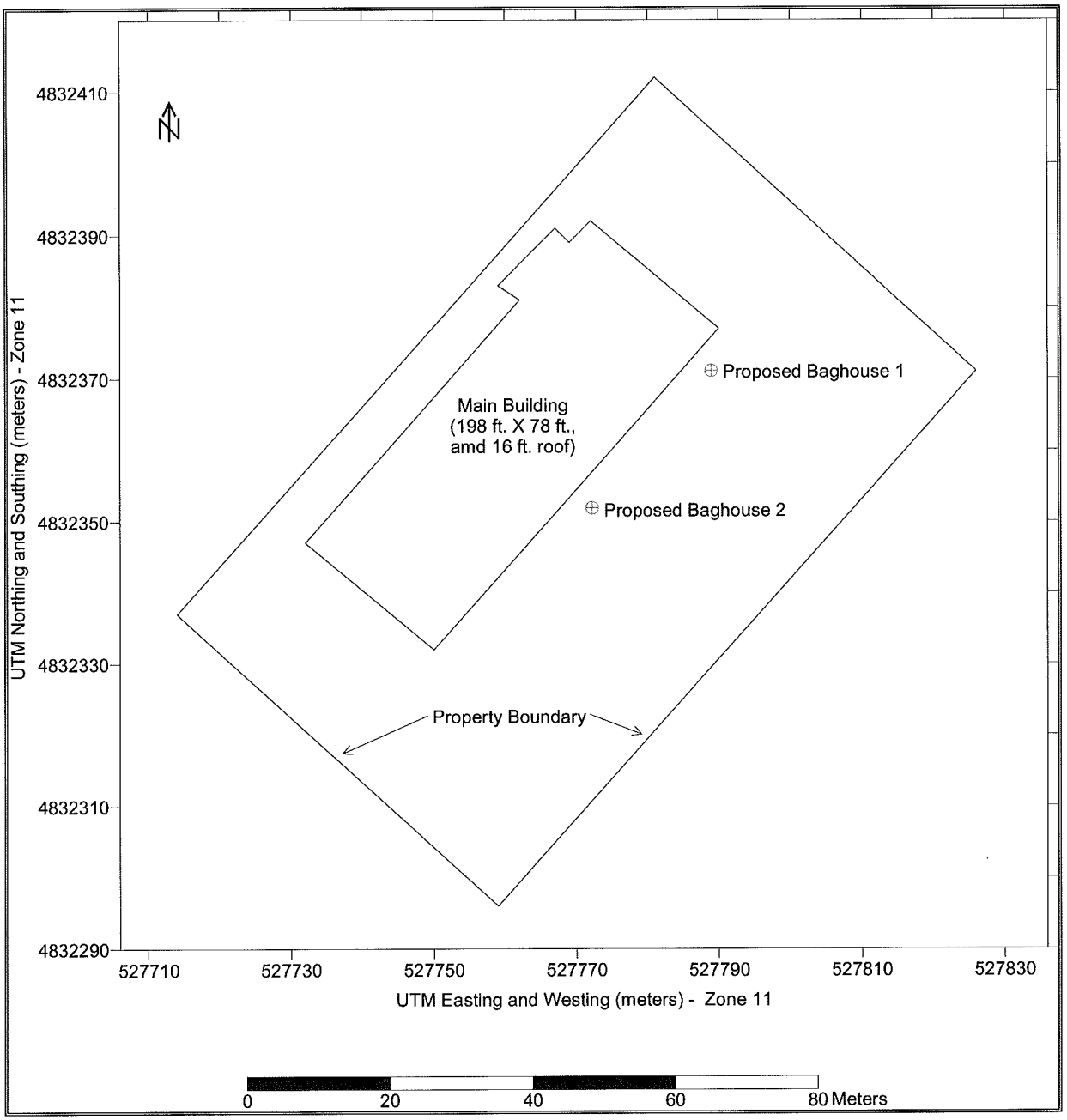


Figure 1-2: Eagle Silicon Caldwell Facility Site Plan

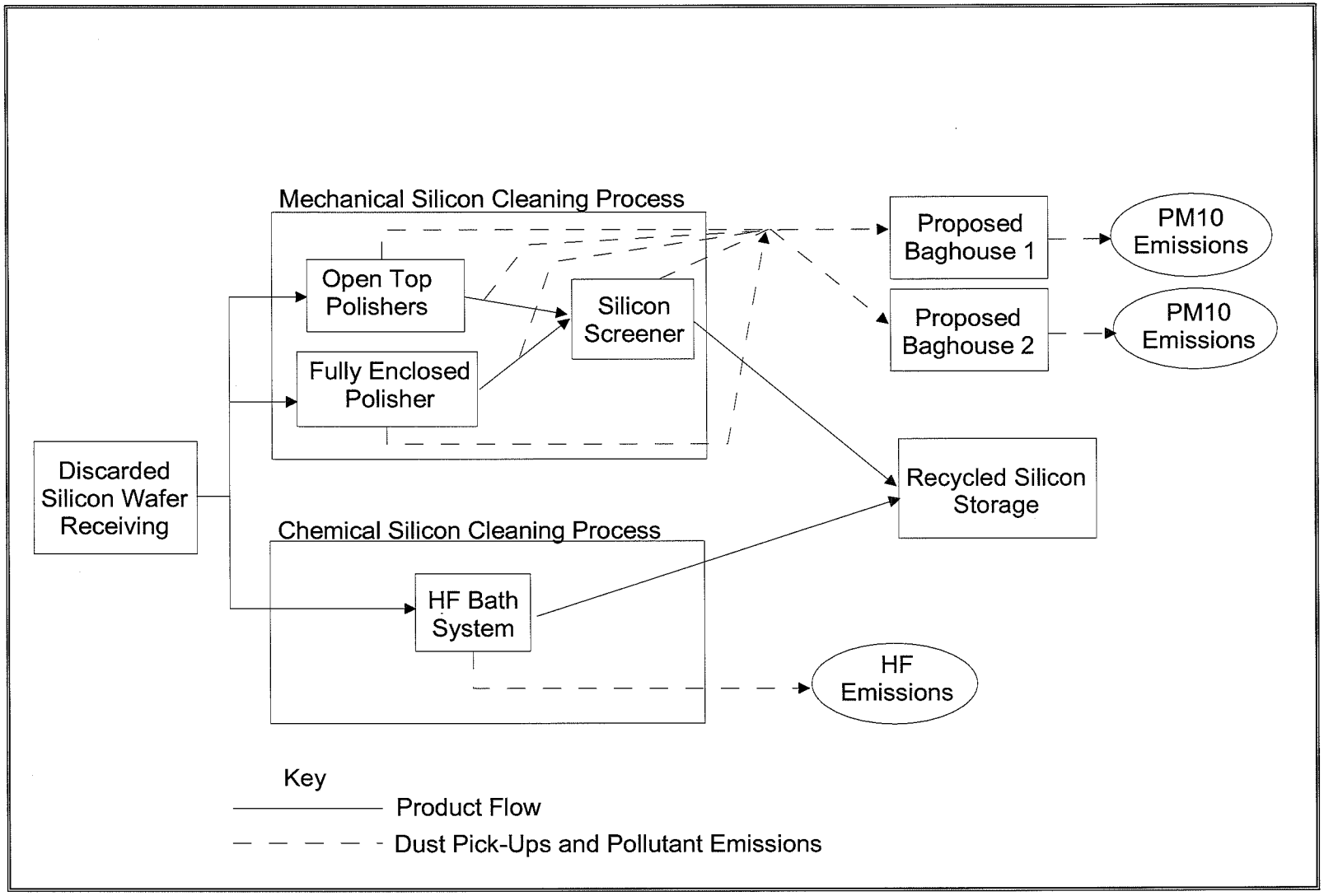


Figure 2-1: Eagle Silicon Caldwell Facility Process Flow Diagram

APPENDIX A

DEQ's Permit to Construct Form

DEQ AIR QUALITY PROGRAM
1410 N. Hilton
Boise, ID 83706
For assistance: 208-373-0502

PERMIT TO CONSTRUCT APPLICATION

Applicants, please see instructions on page 2 before filling out the form.

COMPANY NAME, FACILITY NAME, AND FACILITY ID NUMBER

1. Company Name	Eagle Silicon	
2. Facility Name	Eagle Silicon Caldwell Facility	3. Facility ID No.
4. Brief Project Description - One sentence or less	Installation of two 5,000 cfm baghouses and additional HF systems	

PERMIT APPLICATION TYPE

5. ☐ New Facility ☒ New Source at Existing Facility ☐ Unpermitted Existing Source
☐ Modify Existing Source: Permit No.: Date Issued:
☐ Required by Enforcement Action: Case No.:_____

6. ☒ Minor PTC ☐ Major PTC

FORMS INCLUDED

Included	N/A	Forms	DEQ Verify
☒	☐	Form GI – Facility Information	☐
☒	☐	Form EU0 – Emissions Units General	☐
☐	☒	Form EU1 - Industrial Engine Information Please Specify number of forms attached: _____	☐
☐	☒	Form EU2 - Nonmetallic Mineral Processing Plants Please Specify number of forms attached: _____	☐
☐	☒	Form EU3 - Spray Paint Booth Information Please Specify number of forms attached: _____	☐
☐	☒	Form EU4 - Cooling Tower Information Please Specify number of forms attached: _____	☐
☐	☒	Form EU5 – Boiler Information Please Specify number of forms attached:_____	☐
☐	☒	Form HMAP – Hot Mix Asphalt Plant Please Specify number of forms attached: _____	☐
☐	☒	Form CBP - Concrete Batch Plant Please Specify number of forms attached: _____	☐
☒	☐	Form BCE - Baghouses Control Equipment	☐
☐	☒	Form SCE - Scrubbers Control Equipment	☐
☒	☐	Forms EI-CP1-EI-CP4 - Emissions Inventory– criteria pollutants (Excel workbook, all 4 worksheets)	☐
☒	☐	PP – Plot Plan	☐
☐	☒	Forms MI1-MI4 – Modeling (Excel workbook, all 4 worksheets)	☐
☒	☐	Form FRA – Federal Regulation Applicability	☐

DEQ Staff, please see instructions for handling this form on page 3.

DEQ USE ONLY

Date Received

Project Number

Payment / Fees Included?
Yes ☐ No ☐

Check Number

DEQ AIR QUALITY PROGRAM
1410 N. Hilton
Boise, ID 83706
For assistance: (208) 373-0502

PERMIT TO CONSTRUCT APPLICATION

All information is required. If information is missing, the application will not be processed.

IDENTIFICATION	
1. Company Name	Eagle Silicon
2. Facility Name (if different than #1)	Eagle Silicon Caldwell Facility
3. Facility I.D. No.	
4. Brief Project Description:	Installation of two 5,000 cfm baghouses and additional HF systems
FACILITY INFORMATION	
5. Owned/operated by: (√ if applicable)	☐ Federal government ☐ County government ☐ State government ☐ City government
6. Primary Facility Permit Contact Person/Title	Cory Russell, Vice President
7. Telephone Number and Email Address	208.890.0046; cory@eaglesilicon.com
8. Alternate Facility Contact Person/Title	Ryan Leggett, Facility Manager
9. Telephone Number and Email Address	208.890.1021; ryan@eaglesilicon.com
10. Address to which permit should be sent	3605 Arthur Street
11. City/State/Zip	Caldwell, Idaho 83605
12. Equipment Location Address (if different than #10)	Same as above
13. City/State/Zip	**Same as above**
14. Is the Equipment Portable?	☐ Yes ☒ No
15. SIC Code and NAISC Code	SIC: 3674 Secondary SIC (if any): NAICS: 334413
16. Brief Business Description and Principal Product	Silicon Recycling
17. Identify any adjacent or contiguous facility that this company owns and/or operates	Not Applicable
PERMIT APPLICATION TYPE	
18. Specify Reason for Application	☐ New Facility ☒ New Source at Existing Facility ☐ Modify Existing Source: Permit No.:_____ Date Issued: _____ ☐ Unpermitted Existing Source: ☐ Required by Enforcement Action: Case No.:_____
CERTIFICATION	
IN ACCORDANCE WITH IDAPA 58.01.01.123 (RULES FOR THE CONTROL OF AIR POLLUTION IN IDAHO), I CERTIFY BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE STATEMENTS AND INFORMATION IN THE DOCUMENT ARE TRUE, ACCURATE, AND COMPLETE.	
19. Responsible Official's Name/Title	Cory Russell, Vice President
20. RESPONSIBLE OFFICIAL SIGNATURE	Date:

Emissions Unit - General **Form EU0**

PERMIT TO CONSTRUCT APPLICATION

Revision 3
03/27/07

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Please see instructions on page before filling out the form.

IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
Eagle Silicon	Eagle Silicon Caldwell Facility	
Brief Project Description:	Installation of two 5,000 cfm baghouses and additional HF systems	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

Emissions Unit (EU) Name:	Main Building Ventilation
EU ID Number:	EU1
EU Type:	☒ New Source ☐ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
Manufacturer:	Not Applicable
Model:	Not Applicable
Maximum Capacity:	Not Applicable
Date of Construction:	After, PTC approval
Date of Modification (if any)	
Is this a Controlled Emission Unit?	☐ No ☒ Yes If Yes, complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:	Baghouse 1 (BAGH1) and Baghouse 2 (BAGH2)		
11. Date of Installation:	After PTC Approval	12. Date of Modification (if any):	
13. Manufacturer and Model Number:	To be determined		
14. ID(s) of Emission Unit Controlled:	EU1 (Main Building Ventilation)		
15. Is operating schedule different than emission units(s) involved?	☐ Yes ☒ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐ Yes ☒ No (If Yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency	0.01 gr/dscf	0.01 gr/dscf	--	--	--	--

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	Unknown
19. Maximum Operation	8,760 hours per year

REQUESTED LIMITS

20. Are you requesting any permit limits?	☐ Yes ☒ No (If Yes, check all that apply below)
☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	

Baghouses Control Equipment **Form BCE**

PERMIT TO CONSTRUCT APPLICATION

Revision 3
04/02/07

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Please see instructions on page before filling out the form.

IDENTIFICATION

Company Name: Eagle Silicon	**Facility Name:** Eagle Silicon Caldwell Facility	**Facility ID No.:**
Brief Project Description: Installation of two 5,000 cfm baghouses and additional HF systems		

IDENTIFICATION				BAGHOUSE			BAGS			
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
Emission Unit	**EU ID No.**	**CE ID No.**	**Stack ID No.**	**Baghouse Manufacturer**	**Baghouse Model No.**	**Type**	**Type**	**Size (Dia x Ht)**	**No. of Bags**	**Air to Cloth**
Main Building Ventilation	EU1	BAGH1	BH01	To be determined (TBD)	TBD	TBD	TBD	TBD	TBD	TBD
Main Building Ventilation	EU1	BAGH2	BH02	TBD	TBD	TBD	TBD	TBD	TBD	TBD

Federal Requirements Applicability **Form FRA**

DEQ AIR QUALITY PROGRAM
1410 N. Hilton
Boise, ID 83706
For assistance: (208) 373-0502

1. PERMIT TO CONSTRUCT APPLICATION

IDENTIFICATION		
Company Name: Eagle Silicon	Facility Name: Eagle Silicon Caldwell Facility	Facility ID No:
Brief Project Description:	Installation of two 5,000 cfm baghouses and additional HF systems	

APPLICABILITY DETERMINATION

1. Will this project be subject to 1990 CAA Section 112(g)? (Case-by-Case MACT)	☒ NO	☐ YES*	☐ DON'T KNOW
	* If YES then applicant must submit an application for a case-by-case MACT determination [IAC 567 22-1(3)"b" (8)]		
2. Will this project be subject to a New Source Performance Standard? (40 CFR part 60)	☒ NO	☐ YES*	☐ DON'T KNOW
	*If YES please identify sub-part:		
3. Will this project be subject to a MACT (Maximum Achievable Control Technology) regulation? (40 CFR part 63) THIS ONLY APPLIES IF THE PROJECT EMITS A HAZARDOUS AIR POLLUTANT – SEE TABLE A FOR LIST	☒ NO	☐ YES*	☐ DON'T KNOW
	*If YES please identify sub-part: ____		
4. Will this project be subject to a NESHAP (National Emission Standards for Hazardous Air Pollutants) regulation? (40 CFR part 61)	☒ NO	☐ YES*	☐ DON'T KNOW
	*If YES please identify sub-part: ____		
5. Will this project be subject to PSD (Prevention of Significant Deterioration)? (40 CFR section 52.21)	☒ NO	☐ YES	☐ DON'T KNOW
6. Was netting done for this project to avoid PSD?	☒ NO	☐ YES*	☐ DON'T KNOW
	*If YES please attach netting calculations		

- **IF YOU ARE UNSURE HOW TO ANSWER ANY OF THESE QUESTIONS CALL 1-208-373-0502**

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton Boise, ID 83706 **For assistance: (208) 373-0502**	**PERMIT TO CONSTRUCT APPLICATION**
Company Name:	**Eagle Silicon**	
Facility Name:	Eagle Silicon Caldwell Facility	
Facility ID No.:		
Brief Project Description:	Installation of two 5,000 cfm baghouses	

SUMMARY OF FACILITY WIDE EMISSION RATES FOR CRITERIA POLLUTANTS - POINT SOURCES

		3.											
1.	2.	PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Emissions units	**Stack ID**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**
Point Source(s)													
Main Building Ventillation	BH01	0.43	1.9	--	--	--	--	--	--	--	--	--	--
Main Building Ventillation	BH02	0.43	1.9	--	--	--	--	--	--	--	--	--	--
Total		0.86	3.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton Boise, ID 83706 **For assistance: (208) 373-**	**PERMIT TO CONSTRUCT APPLICATION**
Company Name:	**Eagle Silicon**	
Facility Name:	Eagle Silicon Caldwell Facility	
Facility ID No.:		
Brief Project Description:	Installation of two 5,000 cfm baghouses	

SUMMARY OF FACILITY WIDE EMISSION RATES FOR CRITERIA POLLUTANTS - FUGITIVE SOURCES

		3.											
1.	2.	PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Fugitive Source Name	**Fugitive ID**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**
Fugitive Source(s)													
Not Applicable													
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton Boise, ID 83706 **For assistance: (208) 373-**	**PERMIT TO CONSTRUCT APPLICATION**
Company Name:	**Eagle Silicon**	
Facility Name:	Eagle Silicon Caldwell Facility	
Facility ID No.:		
Brief Project Description:	Installation of two 5,000 cfm baghouses	

SUMMARY OF EMISSIONS INCREASE (PROPOSED PTE - PREVIOUSLY MODELED PTE) - POINT SOURCES

		3.											
1.	2.	PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Emissions units	**Stack ID**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**
Point Source(s)													
Main Building Ventillation	BH01	0.43	1.9	--	--	--	--	--	--	--	--	--	--
Main Building Ventillation	BH02	0.43	1.9	--	--	--	--	--	--	--	--	--	--
Total		0.86	3.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton Boise, ID 83706 **For assistance: (208) 373-**	**PERMIT TO CONSTRUCT APPLICATION**
Company Name:	**Eagle Silicon**	
Facility Name:	Eagle Silicon Caldwell Facility	
Facility ID No.:		
Brief Project Description:	Installation of two 5,000 cfm baghouses	

SUMMARY OF EMISSIONS INCREASE (PROPOSED PTE - PREVIOUSLY MODELED PTE) - FUGITIVE SOURCES

		3.											
1.	2.	PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Fugitive Source Name	**Fugitive ID**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**
Fugitive Source(s)													
Not Applicable													
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

APPENDIX B

Facility-Wide Emission Calculations

Proposed Baghouse 1

Emission Calculations

Flowrate Exiting Baghouse

Baghouse Flowrate
cfm
5,000

Grain Loading

Proposed Grain Loading
gr/dscf
0.01

Emission Calculations

Pollutant	lb/hr	TPY [a]
PM	0.4	1.9
PM10 [b]	0.4	1.9

a - Based on 8,760 operating hours per year (Maximum Potential).
b - Assume all PM is PM10.

Proposed Baghouse 2

Emission Calculations

Flowrate Exiting Baghouse

Baghouse Flowrate
cfm
5,000

Grain Loading

Proposed Grain Loading
gr/dscf
0.01

Emission Calculations

Pollutant	lb/hr	TPY [a]
PM	0.4	1.9
PM10 [b]	0.4	1.9

a - Based on 8,760 operating hours per year (Maximum Potential).
b - Assume all PM is PM10.

HF Bath System Uncontrolled Emission Rate Calculation

The uncontrolled HF emissions are based on the following information:

- Three 11 ¾ inch by 17 ¼ inch surface area HF baths,
- Eagle Silicon uses a HF aqueous solution of 25 percent HF and 75 percent water, by weight.
    - Vapor Pressure of HF is conservatively 2.5 mmHg (0.003289 atm) at conservatively 90 °F and 25 percent HF solution by weight – See attached Honeywell Partial Pressure of HF over Aqueous Solutions of HF.
- The HF bath maximum temperature is approximately 90 °F.

$$Surface\ Area\ of\ Each\ HF\ Bath = (11.75\,inches)(17.25\,inches) = 202.68\,in.^2$$

$$Total\ Surface\ Area\ of\ Three\ HF\ Baths\ (A_{TOT}) = (3)(202.68\,in.^2)\left(\frac{1\,ft^2}{144\,in^2}\right)\left(\frac{0.0929\,m^2}{1\,ft^2}\right) = 0.39229\,m^2$$

$$HF\ Mass\ Transfer\ Coefficient\ (K_{HF})\ u\sin g\ water\ as\ reference - MW_{H20} = 18g/mole; MW_{HF} = 20g/mole;$$
$$K_{H2O} = 0.83cm/s$$

$$K_{HF} = K_{H2O}\left(\frac{MW_{H2O}}{MW_{HF}}\right)^{1/3} = 0.83\,cm/s\left(\frac{18\,g/mole}{20\,g/mole}\right)^{1/3} = 0.80136\,cm/s = 0.0080136\,m/s$$

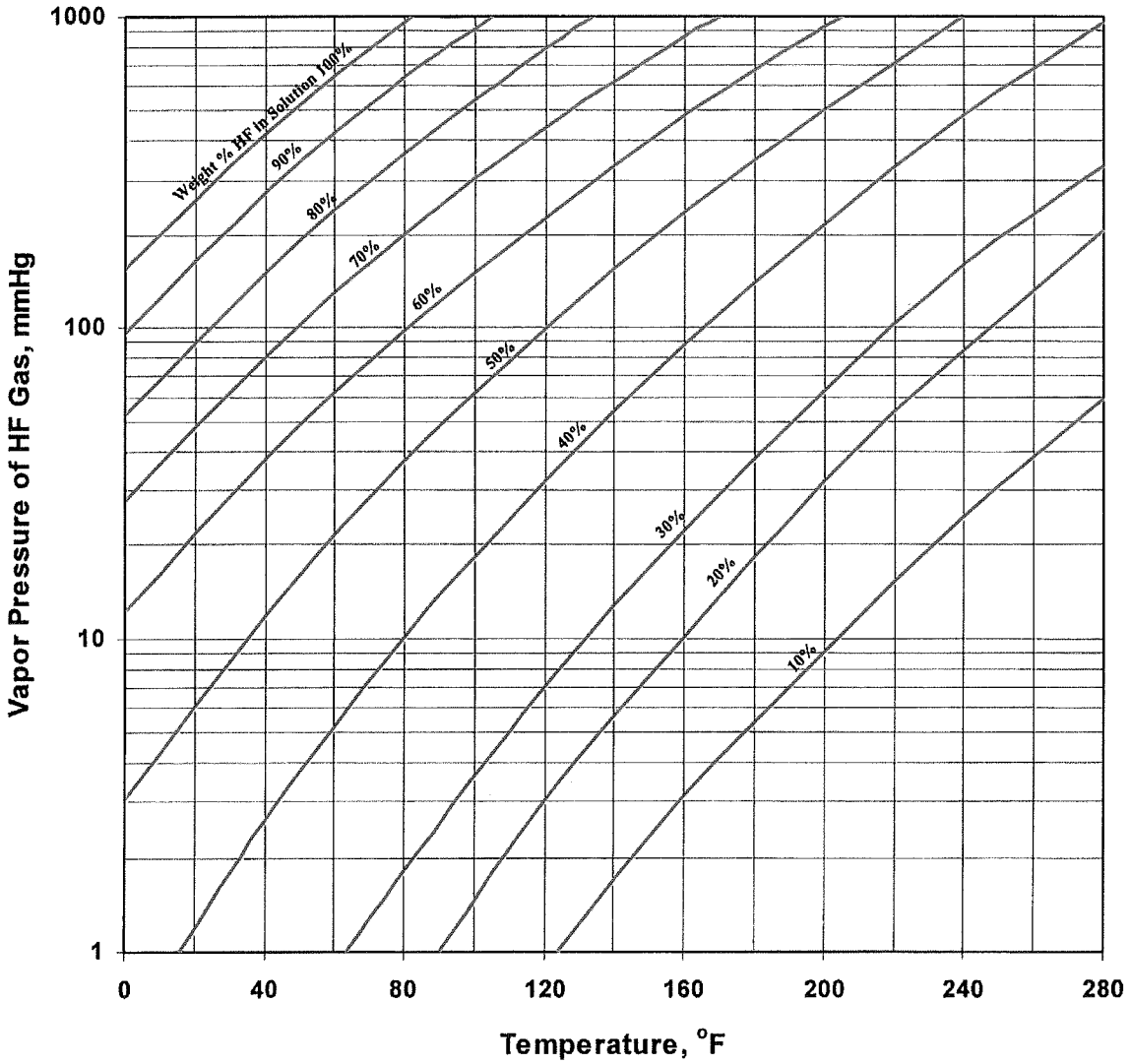
$$HF\ Volatilization\ Rate\ (Q_{HF}) = \frac{M_{HF} * K_{HF} * A_{TOT} * VP_{HF}}{R * T}$$

$$Q_{HF} = \frac{(20\,g/mole)(0.0080136\,m/s)(0.39229\,m2)(0.003289\,atm)}{\left(8.21\times10^{-5}\,\frac{m^3 atm}{mole\,K}\right)(305.4\,K)} = 0.008249\,g/s$$

$$Q_{HF} = 0.008249g/s\left(\frac{1lb}{453.6\,g}\right)\left(\frac{3600\,s}{1\,hr}\right) = 0.065\,lb/hr$$

Honeywell

Partial Vapor Pressure of HF over Aqueous Solutions of HF



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APPENDIX C

Dispersion Modeling Correspondence

Kyle,

Although 0.43 lb/hr is over the published modeling threshold in the Idaho Air Modeling Guide, DEQ has developed secondary discretionary thresholds that are applied on a case-by-case basis, considering other emissions sources at the facility, nature of emissions, and distances to ambient air boundaries. This emissions rate is below the secondary threshold. Since the threshold was developed to ensure impacts below significant contribution levels for modifications, DEQ can easily approve its use when total facility-wide emissions are below the threshold. Based on your description of the facility's emissions, a modeling analysis would not be required to demonstrate compliance with NAAQS.

Please contact me if you have any other questions or concerns.

Kevin Schilling
Stationary Source Modeling Coordinator
Idaho Department of Environmental Quality
208 373-0112

From: Kyle Heitkamp [mailto:kheitkamp@Environcorp.com]
Sent: Wednesday, July 30, 2008 4:48 PM
To: Kevin Schilling
Subject: Eagle Silicon Modeling Question

Kevin,

ENVIRON is preparing a PTC application for Eagle Silicon to install two 5,000 cfm baghouses at their Caldwell, Idaho facility. The Caldwell facility is located at 3605 Arthur Street in Caldwell, Idaho. The facility location and site plan are shown in the attached PDF file. Eagle Silicon purchases discarded silicon wafers from the semi-conductor industry and removes intellectual property (die) to produce pure silicon. At present, the largest consumer of the recycled silicon is the solar panel manufacturing industry.

Currently, the entire silicon recycling operation is taking place inside the main building with mobile mini-baghouses exhausting inside the building, but Eagle Silicon is proposing to install two 5,000 cfm baghouses to provide interior ventilation. Eagle Silicon anticipates that a single 5,000 cfm baghouse will provide adequate capacity for its short-term needs, but wants to allow for rapid expansion in customer demand increases.

The PM and PM10 emission calculations for each baghouse are based on an exhaust grain loading, the maximum air flow rate of each baghouse, and the maximum hours of operation per year. The potential PM emission rate for each baghouse is 0.43 lb/hr (0.01 gr/dscf and 5,000 cfm) and 1.9 tpy (8,760 hours per year). All PM emissions are assumed to be PM10.

The two proposed baghouses will be the only sources of PM and PM10 at Eagle Silicon. The preliminary stack parameters for the two proposed baghouses are presented in the table below. The proposed locations of the two baghouses are shown in the attached site plan.

Table 1. Eagle Silicon Preliminary Baghouse Stack Parameters

	Exhaust Flow Rate	Exit Velocity	Stack Exit Diameter	Exit Temperature	Stack Height	Stack Orientation
Emission Point	cfm	ft/s	ft	F	ft (AGL)	
Baghouse 1	5,000	47.2	1.5	80	30.0	Vertical
Baghouse 2	5,000	47.2	1.5	80	30.0	Vertical

AGL = Above Ground Level

Due to the potential emission rates, stack locations, and stack release parameters of the proposed baghouses, ENVIRON does not expect Eagle Silicon to exceed any applicable PM10 NAAQS. Will a PM10 NAAQS compliance demonstration be necessary for submitting the upcoming Eagle Silicon PTC application?

Please let me know if you have any further questions regarding the proposed Eagle Silicon project.

Kyle

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